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# CHAPTER FOUR

*Kikan-Shido: Between Desks Instruction*

## INTRODUCTION

Of all the lesson events that might be observed in mathematics classrooms around the world, one of the most immediately familiar is that moment when the teacher, having set the students independent or group work, moves around the classroom. This chapter reports a fine-grained analysis of this lesson event in a selection of well-taught mathematics classrooms located in six different cities around the world. The Lesson Event is conceived as an event type sharing certain features common across the different classrooms studied. Each individual Lesson Event had a fundamentally emergent character, suggested by the classroom data as having a form sufficiently common to be identifiable within the classroom data from each of the countries studied. In each classroom, both within a culture and between cultures, there were idiosyncratic features that distinguished each teacher's enactment of each Lesson Event, particularly with regard to the function of the particular event. At the same time, common features could be identified in the enactment of Lesson Events across the entire international data set and across the data set specific to a country. This chapter details the differences and commonalities of 'Kikan-Shido' (Between Desks Instruction) in eighteen classrooms located in Berlin, Hong Kong, Melbourne, San Diego, Shanghai and Tokyo.

### *Methods of Instruction and Patterns of Participation*

Greeno observed that "Methods of instruction are not only instruments for acquiring skills; they also are practices in which students learn to participate" (Greeno, 1997, p. 9). With regard to the learning of mathematics, some classroom practices will resemble those of other communities who habitually employ skills specific to mathematics (the mathematical activities of accountants or surveyors, for example) and some practices will be classroom-specific in the sense of relating to the process of learning (providing particular forms of explanation, asking particular types of questions when in doubt, seeking and offering assistance, and so on). Greeno also made reference to "patterns of participation" developed by students (Greeno, 1997, p. 9). This is a particularly apt phrase, combining the

*D. J. Clarke, J. Emanuelsson, E. Jablonka & I. A. C. Mok (Eds.), Making connections: Comparing mathematics classrooms around the world, 73–105.* 

fluidity of participation in a social setting with the implicit regularity of a pattern. If we are to understand what occurs in social settings, it is the patterns of participation that are likely to offer insight. As will be argued, in considering social interactions in the classroom, the teacher must be considered co-participant with the students in any practices of the classroom community. Like Wenger (1998), this analysis of patterns of participation in classroom settings stresses the multiplicity and overlapping character of communities of practice and the role of the individual in contributing to the practices of a community (the class). Clarke (2001) has discussed the acts of interpretive affiliation, whereby learners align themselves with various communities of practice and construct their participation and ultimately their practice through a customising process in which their inclinations and capabilities are expressed within the constraints and affordances of the social situation and the overlapping communities that compete for the learner's allegiance and participation. By examining classroom practice over sequences of ten lessons, the Learner's Perspective Study (LPS) provides data on the participation of teachers and learners in the co-construction of the possible forms of participation through which classroom practice is constituted (cf. Brousseau, 1986). But co-construction of practice and joint participation in practice do not connote commonality of purpose among the participants in that (classroom) practice. To some extent both teacher and student share a common interest in advancing the student's learning, but they are not positioned identically within that purpose (cf. Davies & Harré, 1991), and their classroom participation will both confirm these positionings and co-construct them. In this chapter, we examine the proposition that not only can the lesson event 'Kikan-Shido' (Between Desks Instruction) serve as the basis for useful comparison of classroom practice across several countries, but it also provides evidence for the co-constructed nature of a particular pattern of participation. This suggests that such Lesson Events, while deriving from the teacher's instructional intentions and reflecting structural characteristics of the mathematics lessons of that classroom, also represent the consequence of a co-constructive process by which particular patterns of participation are established in the classroom.

Classroom Practice is a form of communal collaborative activity as it is constructed through the participation of both teachers and learners and only understood (and optimised) through research that accords value and voice to all participants. It is for this reason that the Learner's Perspective Study supplements the multi-camera documentation of classroom activity with post-lesson reconstructive interviews of the participants. Teaching and Learning are not simply distinct but interdependent activities that share a common setting, rather they should be conceived as aspects of a common body of situated practice and studied as such. It is ironic that recognition of this fundamental unity is enshrined in several languages other than English and that the dichotomisation of Teaching and Learning may be, in part, an artefact of our use of English as the lingua franca of the international education community. This chapter provides evidence of the mutuality of teaching and learning and supports their interpretation as components of a single body of communally constituted practice. We are assisted in this





argument by Harré's work on social positioning (Davies & Harré, 1991) as this gives recognition to the mutuality of social practice, where the positioning of an individual carries both rights and responsibilities and is only sustained by mutual compliance. Of course, a position can be contested, and negotiation is a constitutive element of classroom practice (see Clarke, 2001).

*The Data*

This chapter reports the results of the Learner's Perspective Study based on analyses of sequences of ten lessons, documented using three video cameras, and supplemented by the reconstructive accounts of classroom participants obtained in post-lesson video-stimulated interviews, and by test and questionnaire data, and copies of student written material (Clarke, 1998, 2001, 2003). In each participating country, the focus of data collection was the classrooms of three teachers, identified by the local mathematics education community as competent, and situated in demographically different school communities within the one major city. This gave a data set of 30 'well-taught' lessons per school system (Berlin, Hong Kong, Melbourne, San Diego, Shanghai, and Tokyo), and, for the purposes of the analyses reported here, a total of over 180 videotaped lessons, supplemented by over 50 teacher interviews, and almost 400 student interviews. The teacher and student interviews offer insight into both the teacher's intentions in the enactment of the particular Lesson Event and the significance and the meaning that the students associated with that event.

*Chapter Structure*

In the sections that follow, Kikan-Shido is defined and then discussed from several perspectives: its form as observed on the video record of class activity; its meaning as reconstructed by teacher and students in post-lesson video-stimulated interviews; and its function (intention, action, and interpretation). Our main purpose in this chapter is to use Kikan-Shido to establish the legitimacy and utility of Lesson Events as one basis for international comparison of classroom practice. A secondary purpose is to examine the legitimacy of the characterisation of Kikan-Shido as a whole-class pattern of participation, and to situate the actions of teacher and learners in relation to this pattern of participation. It will be argued that while engaging in Kikan-Shido, the teacher and the students participate in actions that are mutually constraining and affording, and that the resultant pattern of participation can only be understood through consideration of the actions of all participants. Comparison of the enactment of Kikan-Shido across 180 videotaped lessons in the data set provides significant insight into the pedagogical principles underlying the practices of different classrooms internationally. In making this argument, we are positing Lesson Events as a category (and Kikan-Shido as a particular instance) with the capacity to sustain useful international comparisons of classroom practice.

## KIKAN-SHIDO: BETWEEN DESKS INSTRUCTION

Japanese teachers possess an extensive vocabulary with which to describe their practice. Among the large number of terms available to them is the term 'Kikan-Shido,' which means 'between desks instruction', in which the teacher walks around the classroom, predominantly monitoring or guiding student activity, and may or may not speak or otherwise interact with the students. Our use of 'Kikan-Shido' honours the existence in one language of an established term that succinctly encapsulates an activity that could only be described in English by an extended phrase or lengthy definition. The utilisation of such terms conforms to a tradition that has seen 'déjà vu' and 'Schadenfreude' assimilated into English usage for precisely the same reasons. Whenever a particular activity (in this case, a lesson event) is succinctly and accurately designated by a local term, and no equivalent label exists in English, it is entirely appropriate for an international study such as this to acknowledge that culture's recognition of the activity by appropriating the local term for international use. So, for the purposes of this discussion, we will use the Japanese term, 'Kikan-Shido,' as a signifier or cipher for a general conception of the particular activity – one that takes into account the patterns of participation of both teacher and students in the activity designated by 'Kikan-Shido'.

Kikan-Shido was clearly recognisable in a variety of mathematics classrooms internationally, both to researchers and to classroom participants (teachers and students). For all classrooms in the data set, the activity of Kikan-Shido appeared to have four mutually exclusive principal functions: (i) Monitoring Student Activity, (ii) Guiding Student Activity, (iii) Organisation of on-task activity, and, sometimes, (iv) Social Talk. Each principal function is defined in Table 1.

*Table 1. Definition of the Principal Functions within Kikan-Shido*

| | |
|---|---|
| | **Monitoring Student Activity**<br>The process by which the teacher observes the progress of on-task activities and homework, ascertains student understanding, or selects student work, with intent to keep track of student progress, question student comprehension and record student achievement. |
| | **Guiding Student Activity**<br>The process by which the teacher gives information, elicits student response in order to promote reflection, or facilitates engagement in classroom activity, with intent to actively scaffold the development of student participation and comprehension of subject matter. |
| | **Organisational**<br>The process by which the teacher distributes and collects materials, or organises the physical setting in the classroom, with intent to support interactions among students and facilitate student engagement in learning activities. |
| | **Social Talk**<br>The teacher engages with student(s) in conversations not related to the subject matter or current on-task activity. |





Each principal function comprises a number of activity codes that have recurrent form across all 180 taped lessons (see Table 2).

*Table 2. Activity Codes Defined*

| | | |
|---|---|---|
| Monitoring | | **Selecting Work**<br>Students are chosen to share their work, methods or thinking with the whole class. This may occur immediately or later in the lesson. |
| | | **Monitoring Progress**<br>Teacher walks around the classroom observing student progress of on-task activity. |
| | | **Questioning Student**<br>An expression of inquiry that invites or calls for a reply from a student that may or may not be related to the current on-task activity. |
| | | **Monitoring Homework Completion**<br>While students are engaged in on-task activity, the teacher observes the completion of homework and may note student achievement or understanding of subject matter. |
| Guiding | | **Encouraging Student**<br>Activity pursued by the teacher intended to motivate, provide support and feedback to individuals or groups of students. |
| | | **Giving Instruction / Advice at Desk**<br>Teacher scaffolds the development of students' understanding by providing information, instruction or advice, focusing on the development of a concept that addresses meaning, reasoning, relationships and connections among ideas or representations, or the demonstration of a procedure. |
| | | **Guiding Through Questioning**<br>A series of specific teacher questions intended to scaffold the development of student understanding of a procedure or concept during the on-task activity. |
| | | **Re-directing Student**<br>Activities pursued by the teacher to regulate the behaviour of student(s) who are perceived not to be paying attention to the current activity, and to support students' on-going engagement during the lesson. |
| | | **Answering a Question**<br>Information given by the teacher when requested by a student. |
| | | **Giving Advice at Board**<br>Instruction or advice given while an individual or group of students work at the board. The instruction or advice may be intended for those students working at the board or may be intended for the whole class. |
| | | **Guiding Whole Class**<br>Teacher walks around the classroom and provides information, instruction or advice intended for the whole class. |
| | | **Handout Materials**<br>Teacher walks around the classroom distributing materials related to on-task activity. |
| | | **Collect Materials**<br>Teacher walks around the classroom and collects materials from students. |
| | | **Arranging Room**<br>Teacher repositions furniture to enable independent, paired, group or board work. |
| | | **School Related**<br>Teacher engages in conversation related to school activities or curriculum. |
| | | **Non-School Related**<br>Teacher engages in conversations of a social nature not related to the subject matter or on-task activity. |

Monitoring Student Activity is made up of four activity codes: (i) selecting work, (ii) monitoring progress, (iii) questioning student(s), and (iv) monitoring homework completion. Guiding Student Activity comprises seven activity codes: (i) encouraging student(s), (ii) giving instruction or advice at the student's desk, (iii) guiding through questioning, (iv) re-directing student(s), (v) answering a question, (vi) giving advice at board, and (vii) guiding whole-class. Organisational consists of three activity codes: (i) handout materials, (ii) collect materials, and (iii) arranging the room. Social Talk comprises two activity codes: (i) school-related talk, and (ii) non-school-related talk. Table 2 presents the definitions for each activity code. Where it occurs in Tables 1 and 2, the term 'scaffold' is used to designate teacher support for student construction of knowledge.

The theoretical difference between Monitoring Student Activity and Guiding Student Activity is similar to the difference between elicitation and initiation as these are theorised and discussed by Lobato, Clarke and Ellis (2005).

> Initiating/eliciting is not a simplistic dichotomy like "tell/not tell"—it's not an either/or. Both categories of action are necessary and their use is interrelated . . . . Elicitation occurs when the teacher wants to learn more about students' images, ideas, strategies, conjectures, conceptions, and ways of viewing mathematical situations. When the teacher's communicative act *functions* to facilitate the expression of the student's mathematics, then this constitutes "eliciting." . . . . Initiating is often preceded by eliciting, so that the teacher can gather information about students' thinking before making a judgment whether to work with and structure the students' ideas or to introduce new information. Initiating involves the insertion of new ideas into the conversation, ideas that the teacher assumes will be interpreted in many different ways rather than passively received. Once the teacher engages in initiation, she then steps back and elicits to see what the students did with that information. Both actions have their function within the teacher's promotion of student conceptual development (Clarke, 2005, pp. 13, 14).

The distinctions between each principal function and each activity code are substantive. Each principal function and corresponding activity code are empirically grounded and the application of all principal function codes and activity codes listed in Tables 1 and 2 were subjected to inter-rater reliability checks and a level of greater than 80% was consistently maintained. Within those events classified as Kikan-Shido, both the principal codes and activity codes are coverage codes, since they are mutually exclusive and, in combination, account for all documented activities. Using *StudioCode* video analysis software, it was possible to code for Kikan-Shido, and its various functions, as they occurred in the video record (Figure 1).

Using the coding system as shown in Figure 1, we can map the various activity codes to a timeline of a single lesson (see Figure 3). For the purpose of statistical analyses, the individual timelines from each lesson were combined to identify the frequency of each activity code.





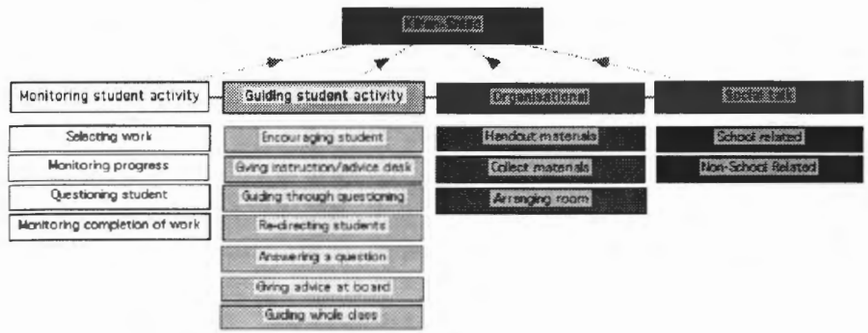


*Figure 1. Kikan-Shido code input window*

While the participants in many classrooms may conspire in the enactment of Kikan-Shido, the actual functions served by Kikan-Shido help us to distinguish one classroom from another. The ways in which different teachers initiate Kikan-Shido are diverse and distinctive. This can be seen graphically in the comparison of 180 lessons across six countries in the LPS data set (see Figure 2).

An essential point must be made here: we have analysed sequences of ten or more lessons taught by eighteen teachers designated as competent in six different countries. We do not presume to characterise the teaching of a country or a culture on the basis of such a selective sample. Nor do we intend to compare teaching in one country with teaching in another. Most importantly, we commenced our analysis intending to compare and contrast teachers and their classrooms, not cultures. As will be shown in the results that follow, a particular practice documented in one American classroom might also be a distinctive feature of a classroom in Japan. Where such classroom practices are found in such culturally-disparate circumstances, the particular practice assumes heightened significance. That fact that teachers situated very differently have developed similar solutions to a particular classroom challenge suggests not only the generality of the pedagogical strategy but also its cultural transferability. The occurrence of such culturally-distributed practices problematises simplistic East-West comparative cultural analyses.

Figure 2 graphically illustrates both the similarities and the significant differences in the way that 18 competent, experienced teachers enacted the lesson event that we have called Kikan-Shido. For example, A-T3 and US-T3 both devoted about 45% of their class time to Kikan-Shido, but Figure 2 makes it clear that the relative weightings of monitoring versus guiding activity were completely different. If we compare G-T3 with HK-T3, we find similarity not only in the time devoted to Kikan-Shido, but even in the relative proportions of monitoring and guiding.

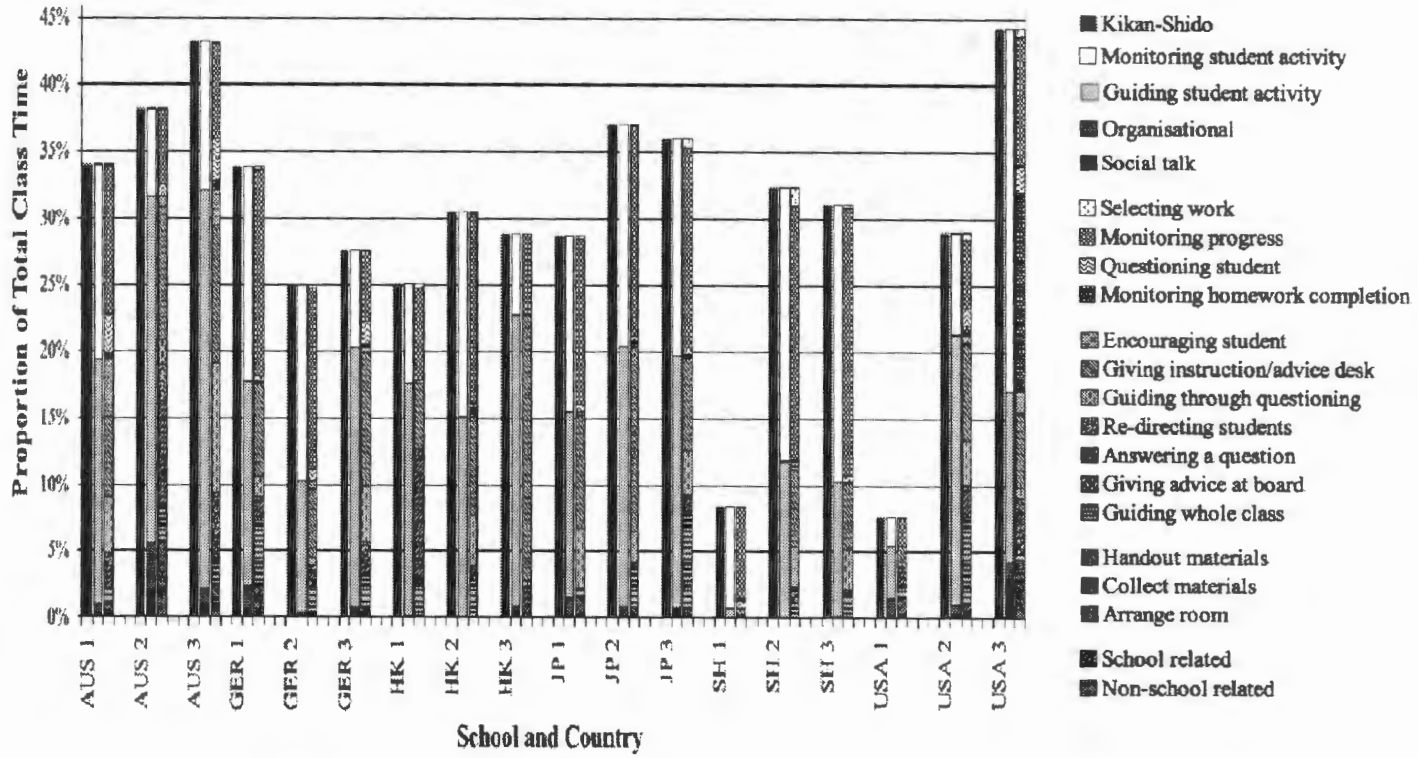


*Figure 2. Comparison of Kikan-Shido across 180 lessons*

However, at the next level of analysis, we find significant differences in the manner in which the monitoring and guiding activities were carried out.

The teacher from US School 3 made extensive use of Kikan-Shido in every lesson and for extended periods of time. Generally, the teacher engaged in Kikan-Shido during Warm Up or after setting a learning task. One-third of the teacher's extensive Kikan-Shido activity was committed to monitoring homework completion. Interestingly, if this component (monitoring homework completion) were removed from US-T3's Kikan-Shido record, her use of Kikan-Shido would closely resemble that of A-T1, even to the relative proportions of the activity codes. Monitoring homework completion was an administrative responsibility that clearly influenced the classroom practice of US-T3. Real understanding of the decisions and pedagogical principles underlying each teacher's classroom practice is only evident from a fine-grained analysis of Kikan-Shido as it was enacted in each classroom.

## INDIVIDUAL TEACHER USE OF KIKAN-SHIDO

### *Differentiated Instruction for Individual Students*

During Kikan-Shido, Australian Teacher 1 monitored student progress with the on-task activity (11.2% of total lesson time over all sampled lessons coded as Monitoring Progress). Drawing on the insights gained from observations of students at work, the teacher appeared to adopt different strategies for individual students with the intention of facilitating student understanding. This is illustrated in the following quote.

A-T1 I have a different intention for each student that I approach I think.

Int Can you tell me a little bit more about that?

A-T1 For example, Earl. These boys they um … really *get into it* … and *want to be right* and want to solve it … and they *will*. Earl will appreciate … oh actually … oh most of them do if I come around and they want me to check their work … and so they will wait patiently until I come around- so that's what they do. Kamahl sits there and has a lot of trouble … but doesn't take many steps to help himself … at all unfortunately. Because he doesn't want to appear that way. Sometimes … um … there are a couple of people I need to hint and ask them what they're thinking … because they are not comfortable with the work.

Int Mmh [softly]

A-T1 This is the sort of work that would apply to that - … about half the class would really appreciate but the other part would just wish that I just … told them how to do it and they could just repeat it.

Int Okay mmh [softly]

A-T1 So it doesn't suit everyone at the moment … this sort of question.

Int Right … who are the ones who would be enjoying it and who are the ones who wouldn't?

A-T1 Sandy wouldn't, Sandy wouldn't enjoy this. … Mel's a- Mel asks questions, that's the first thing she does, she doesn't think

… she doesn't even take a moment to think about it. She, she's a, she's very verbal, she will say what she's thinking and ask immediately so she's not afraid to ask but I'm not going to answer her questions necessarily but she'll say no I don't know how to do this, she won't take … a moment she's very … immediate.

*Key to symbols used in transcripts in this chapter*

| | |
|---|---|
| … | A pause of one second or less |
| ( ) | Empty single parentheses represent untranscribed talk. The talk may be untranscribed because the transcriber could not hear what was said |
| . . . . | Omitted text |
| // | Marks the beginning of simultaneous speech. |
| (text) | A plausible interpretation of speech that was difficult to hear |
| [text] | Comments and annotations, often descriptions of non-verbal action |
| *text* | Italicised text indicates emphatic speech |
| text | Underlined text indicates emphasis added by the authors. |

### *Motivational Support and Encouragement*

Encouragement was coded and clustered within Guiding Student Activity. It is distinguished from social categories such as Non-school Related Social Talk as it was clear, both to researchers and to classrooms participants (teachers and students), that this strategy was an instructional act related to the on-task activity and intended to motivate and to provide support and feedback to individuals or groups of students.

On many occasions, Australian Teacher 1 would provide verbal encouragement to individual students (see Figure 3 for Teacher 1's utilisation of Kikan-Shido across all ten lessons). In fact, the practices of all three teachers in Australia and those of US Teacher 3 appeared to prioritise the development of student confidence by providing motivational support and encouragement.

A-T3 She needs that encouragement … she's not particularly independent and she's not well skilled and she relies heavily on a lot of other students … on this day she was by herself doing the task … and that was really pleasing … mmm.

Such explicit encouragement was much less evident in the other classrooms studied. In fact, the teachers in the Asian data set (Shanghai, Hong Kong and Tokyo), with the exception of Shanghai Teacher 2 (0.4% of total class time devoted to Encouraging student), typically did not encourage students during Kikan-Shido. On the occasions when encouragement was given, it was directed at individual students or the whole class.

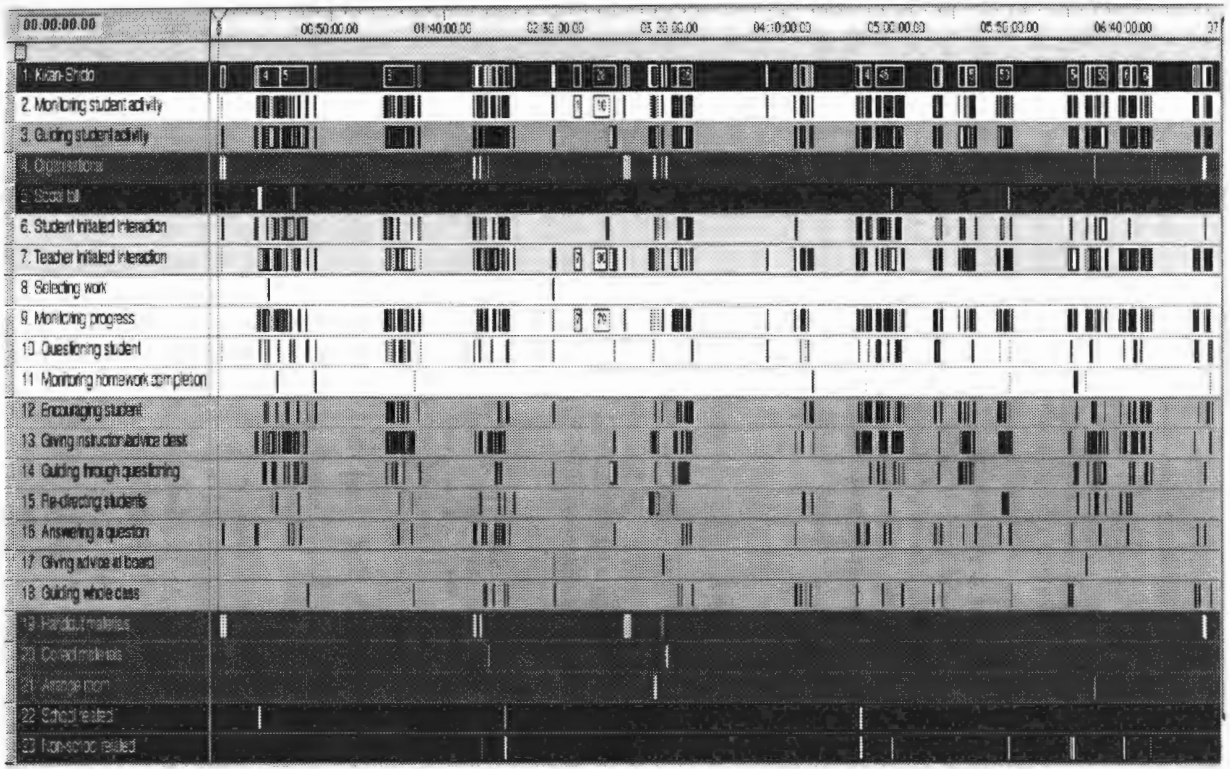


*Figure 3. Australian Teacher 1's utilisation of Kikan-Shido across a ten-lesson sequence*

The only instance of Encouraging the Student coded in Shanghai School 1 illustrates a unique strategy that was employed by the teacher intended to encourage, motivate and provide feedback to individual students while addressing the whole class:

SH-T1 Be quick – finish the other one. Eh, [to whole class] some of you drew it very well. [Points to student 4's work] You drew it wrongly. [To student 5] You also were wrong. [To student 6] You. You speed up [moving down the row]. You did it right [pat on the back of student 8] [taking up the paper of student 9]. Eh, he did it right. [to whole class] Student 9 also did it right.

In this example, the teacher draws the attention of the class to the student's error. While the teacher's intentions appear to be motivational, there is no example of this strategy (public announcement of student error) in the Australian, American, German or Japanese data. Such statements were recorded in SH1, SH2, HK1 and HK2. This suggests that encouragement and motivation in these four classrooms were predicated on a value system different from that operating in non-Chinese classrooms.

### *The Distribution of Responsibility for Knowledge Generation*

Another characteristic of Kikan-Shido, as it is practiced in US School 3 and in Shanghai School 2, is the implicit devolution of the responsibility for knowledge generation from the teacher to the student, while still institutionalising the teacher's obligation to scaffold the process of knowledge generation being enacted by the students.

US-T3 And then every class they do group things, and so they are pretty used to it. And then if the whole group doesn't understand they can raise their hands and the first thing I will do is make sure that they've talked to each other. And then I say what did you try, show me what you tried first.

This echoed the statement by many students in US3. One example is cited below.

S1 And whenever we have a question we have to ask our- our table, and if no one knows then we raise our hand and ask the teacher.

Int Oh, okay. And what does Mrs. J do when you ask her?

S1 She helps you.

'Teacher help' usually came in the form of instruction or advice at a student's desk, advice at the board or answering a question.

US-T3 Well I'll give 'em little hints or I'll tell 'em, you know look at C, or where is your part B you didn't write that out, I think if you write out and do all of part B then you'll see it. But I- they're at that point yeah, I give 'em little helps. Now if there's two and three groups and they're all having the same questions, that's when you know, you're supposed to stop, bring everybody back to the overhead and actually go through more examples or work with them through





the really hard part that they're not getting, so that you don't have to go say it, you know, six and eight individual times. And you just have to judge when that is, you know when they all- it's better use of your time to stop and bring them all back together and tell them all.

In Shanghai School 2, the students rarely talked directly to each other – classroom conversation was always mediated by the teacher. This high level of teacher orchestration might not appear to devolve responsibility or agency to the students; however, in one lesson, the teacher said, "Look at Shiqi's solution! This is much better than the usual method, copy this down." This public recognition of novel student work signifies a willingness by the teacher to assign students an active role in the generation of new mathematical knowledge. On other occasions, the same teacher would give quite explicit instruction to the class. The contemporary reform agenda in Australia and the US actively encourages teachers to elicit student mathematical understandings but is much less explicit about when the teacher should contribute their own mathematical knowledge to classroom discussion (e.g. Chazan & Ball, 1999; Wood, Nelson & Warfield, 2001). In Shanghai School 2, we see the interweaving of teacher initiation and elicitation (Lobato, Clarke & Ellis, 2005), which sustains a mutuality and complicity between teacher and students in the construction of (mathematical) knowledge.

The practices of SH-T2 provided some powerful supporting evidence for the contention by Huang (2002) and Mok and Ko (2000) that the characterisation of Confucian-heritage mathematics classrooms as teacher-centred conceals important pedagogical characteristics related to the agency accorded to students; albeit an agency orchestrated and mediated by the teacher. Our analyses have demonstrated the utility of 'the distribution of responsibility for knowledge generation' as an explanatory framework capable of distinguishing usefully between classroom practices in both 'Asian' and 'Western' settings.

### *Kikan-Shido as a Class-Debugging Mechanism*

Kikan-Shido could also serve a diagnostic role. The diagnosis could relate to particular student difficulties or to the relative effectiveness of a teacher's explanation during a whole-class discussion. Upon identifying such difficulties or concerns during Kikan-Shido, the teacher could act in several different ways: either by giving individual students personal assistance, if the problem was not a general one, or through whole-class discussion of a misunderstanding or difficulty that appeared to be widespread. For example, German Teacher 2 provided instruction and advice intended to address and guide the whole class. One example taken from the video record is cited below:

G-T2 Right, then let's stop at this point immediately now … The … walking around has shown to me many … also small technical difficulties that you have, and now we're going to try one by one …

This is echoed by one student:

S Then if we're working on a problem and everybody has a different answer and we don't know why, then we ask Mister I … then he like comes over to us and explains it … to all of together and then … and if we still don't get it, then he usually calls all of us up to the board, or calls one of us to the board and then the whole group, I mean the whole class listens, … explains the problem, what the problem was and then he explains it to the whole class.

Int What would you do if you couldn't ask Mister I here?

S All right, then I would ask the whole class.

One of the Australian teachers (A-T1) used Kikan-Shido as an opportunity to gauge the success of her whole-class introduction of new content. In one instance, her use of Kikan-Shido revealed widespread student difficulties.

A-T1 Oh … this was *terrible* … as soon as I started going around oh I felt bad about this but it didn't matter too much … that I hadn't talked about- I *assumed* … that they knew what the base and height of a triangle … *is* … and how to recognise it … and … I might have gone to Kamahl first or to someone and it just sort of … was made *very obvious* that I hadn't … but that that's also another thing that I do, I do go to see them straight away so they can tell me … what they don't understand- that that gives me a much better … understanding of whether … what I have done up the front is of is of any value at all.

Int And then gives you a chance to (ask them).

A-T1 And gives me a chance yes … and then I went around and checked with … with some key students whom I know *struggle* and I was … feeling quite confident about it after that although … my explanation here isn't all that crash hot I've … probably because I hadn't had a chance to really think about it and I wasn't sure how to … how to make it clear … like how you'd identify the base and the height … cause I sort of … because I hadn't really thought about it … it was kind of a *gut* … what do I do how do I help them how do I help them … so it wasn't … [sigh].

### *Monitoring and Guiding as Teacher Characteristics*

The relative frequency of Monitoring and Guiding emerged as a key characteristic of individual teachers. This characteristic and the actual form taken by each teacher's use of Monitoring and Guiding could be used to distinguish one classroom from another. For example, the practices of Shanghai Classroom 2 and Hong Kong Classroom 3 appeared to be predicated on different pedagogical principles. Specifically, in Shanghai School 2, the teacher appeared to assume a capacity in the students to develop new mathematical knowledge. In post-lesson interviews, the teacher made comments such as:

SH-T2 During the process, don't teach them mechanically, don't teach them mechanically, let them brainstorm, enhance their flexibility . . . . I was not afraid that students had all sorts of questions, I just let them appear … Sometimes if you restrict them from doing this or that, their problems won't appear, right? But the problems will appear tomorrow even if they didn't today, right?





This teacher made reference in all three interviews to an activity that was translated as *inspecting around*, which was identified in our analysis as Monitoring Progress.

SH-T2 I inspected around and took a passing glance. You have to discover those good points from the students. If there are any mistakes, you have to sort them out.

In several interviews, students in SH2 expressed their appreciation of teacher explanations and the correction of their errors in both whole-class and one-to-one settings.

S The teacher explained our mistakes to us. Then we became more careful when we worked on the exercises.

Consistent with the conclusion drawn by Huang (2002), the practice of Hong Kong Teacher 3 appeared predicated on different pedagogical principles from those underlying the practice of Shanghai Teacher 2. While the dominant function of Kikan-Shido in Shanghai School 2 was to Monitor Student Activity (20.5% of total class time), in Hong Kong School 3, a larger proportion of time was devoted to giving direct guidance (21.9% of total class time). The teacher would walk around the classroom in order to help students with their difficulties, and the guidance during Kikan-Shido was typically quite directive, as illustrated in this example:

S [in Chinese] Come here! Come here! Hey! Hey! Come here! I don't know how to do question four! ( )

HK-T3 [in Chinese] A little bit different! This time … these two … Both twenty-one and twenty-four are multiples of three!

S [to T in Chinese] Yes! Just to simplify it? Okay.

HK-T3 [in Chinese] It isn't to simplify it! It can't be simplified! This one no either ( ) this one is okay! This one can be simplified but this one cannot.

S [to T in Chinese] Then how?

HK-T3 [in Chinese] So … this one is okay! This can be simplified! You have to divide this by seven and then multiply it by eight.

The significance of the teacher's guidance was acknowledged by the same student in the post-lesson interview:

Int Why is it important? This part?

S It's important because he came over to teach me.

Int Mm, why is it important?

S I didn't know how to do it, he came over to teach me, then I can do it.

"He came over to teach me, then I can do it" is reminiscent of student accounts of effective teaching elicited in research studies in the days before video-recording of classroom activities (e.g. Clarke, 1985). Lacking video records to assist (and to corroborate) their reconstructive accounts, descriptions of classroom practice were provided by students in response to such prompts as "Think of the best mathematics teacher you ever had. What was it she did that was so good?"

Students would routinely reply, "She explained things really well." It is now clear, from comparison of students' descriptions of teachers' instructional acts with the video record of those acts, that such student accounts are constrained by the students' lack of a technical pedagogical vocabulary and their difficulty in recognising many of the subtle and sophisticated techniques employed by their teachers to elicit the students' mathematics and to initiate into the classroom conversation elements of the teacher's mathematics (Clarke & Lobato, 2002; Lobato, Clarke & Ellis, 2005). The research methods employed in this study allow the student's account to be juxtaposed with the researcher's inferences from the video record, resulting in the constructive elaboration of both accounts.

*Code Switching*

In Hong Kong School 3, while the instructional language is English, the teacher found himself faced with students' constant demands for Chinese explanations, which were clearly conveyed in one student's request: 講中文啦! ["Chinese please!"] (HK3-L04). This type of teacher-student interaction was especially evident when it came to introducing a new mathematical term:

HK-T3 Now, I want you to meet with the word. Now I want you to meet with the word 'simultaneous equations'.
HK-T3 Now, what do we mean by the word "simultaneous" -huh?
S Chinese meaning.
HK-T3 聯立方程 [Lian Li Fang Cheng – literal translation: Simultaneous Equations]
S 聯咩話？[Lian Mei Hua? – literal translation: Simul-what?]
HK-T3 立呀。聯立。聯立方程。[Li Ya. Lian Li. Lian-Li-Fang-Cheng – Literal translation: Taneous. Simultaneous. Simul-taneous Equa-tions.]

Code switching in this classroom appeared to be a normative practice that was co-constructed by both the teacher and students, and which was predominantly enacted during Kikan-Shido. The co-constructed nature of this practice was evident in the teacher's statement quoted below, in which he clearly conveyed the challenges of choosing the instructional language to address students' needs, while still maintaining the institutional agenda.

HK-T3 This one, when he cannot follow he asks his neighbour. In this way you will see that when I teach I use English. But if they have questions, when they have questions, I will use Chinese. When they individually ask me questions we have to use Chinese. Because umm, the students from my observation, I mean from my observation in the past, their standard of English has not reached that level … This student, the first one, um, he always tell me that he can't do it, he can't understand people speaking in English. He says I have to speak in Chinese. I have told him many times that hey, here, this school is an EMI school. It's impossible that I teach in Chinese. Therefore, you'll see that he's either expressionless or asking the two classmates sitting behind how to do it.





*Selecting Work*

Another distinctive feature of Kikan-Shido, as enacted in Shanghai School 2, Japan School 3, and US Schools 2 and 3, is the Selecting of Student Work to be shared with the whole class, either immediately or at some later time in the lesson. The teacher in Shanghai School 2 made use of selecting work in almost every lesson, and usually more than one student was selected to present their solutions on the board.

In this example, the class was attempting to solve the following systems of equations using the method of elimination by adding/subtracting.

(A)
$$\begin{cases} 2x - y = 5 & \text{[Eq. 1]} \\ 3x + 4y = 2 & \text{[Eq. 2]} \\ 8x - 4y = 20 & \text{[Eq. 3]} \end{cases}$$

(B)
$$\begin{cases} 3x + 4y = 16 & \text{[Eq. 1]} \\ 5x - 6y = 33 & \text{[Eq. 2]} \\ 9x + 12y = 48 & \text{[Eq. 3]} \\ 10x - 12y = 66 & \text{[Eq. 4]} \end{cases}$$

$$19x = 144$$

$$x = 6$$

SH-T2 [T walks around. Picks up S1's sheet. Problem A] Revise this bit, best if you write down equation [number] three, equation one plus equation three, oh no three plus two. Write down equation three properly here. Copy your work on the blackboard …
SH-T2 [to S4. Problem B] This became equation number three, eh write three down here – what does this become? Equation four. Equation three plus equation four. Um, they can be divided? Six? Is it six?
S4 Six.
SH-T2 Yep, very good, keep working. Write it on the blackboard, you did it well today, come on and write it on the blackboard. …
SH-T2 [to S6. Problem B] Write it on the board, that side.

In solving these two systems of equations, this teacher deliberately Selected Work from students to represent a variety of solution methods (in this example, the second problem was solved differently by S4 and S6), and these solution methods were subsequently shared among the class. It is clear that in this classroom, Selecting Work was an instructional strategy that was purposefully employed by the teacher to give voice to students' ideas as well as to share alternative solution methods with the whole class. The teacher's deliberate use of this strategy to distribute responsibility for knowledge generation was made evident in the post-lesson interview, where he emphasised the importance of allowing student misunderstandings to be made visible to the whole class.

SH-T2 I think it is no big deal even if they are wrong. Just let them appear, right? Through the corrections amongst the students and the interactions between the teacher and students, you can correct them … I truly feel that, during so many years of teaching, I have many ways of solving a problem, where do they come from? From their [the students'] supplementary remarks.

The students in this classroom appeared to share the same valuing, as was explicitly acknowledged by one student in this example:

S Just then the teacher was listening to their discussions and corrected them, and then he invited a classmate to do it on the blackboard. The teacher always lets us, he listens to our opinions, and then chooses a correct one or a few and a wrong one, to make a comparison, to find out which is correct, which is wrong … to let us compare and find out where the mistake is, mainly to make it clear which one is which, which one is made incorrect more often, and so we have to correct such a habit.

The student identifies two important teacher practices: (i) The involvement of the students in identifying errors and misconceptions and (ii) the highlighting of those misconceptions that are most common. The student's repeated reference to "our," "us," and "we" confirms the success of the teacher's devolution of responsibility to the students.

*Orchestrating Whole-class Activity*

Although most of the teacher support during Guiding Student Activity was directed to individual students, teachers (particularly in A2, G1, G2, HK1, HK2 and J3) repeatedly provided information, instruction or advice intended to inform the whole class. This type of activity was coded as Guiding Whole Class within the code Guiding Student Activity.

The exercise of Guiding Whole Class during Kikan-Shido suggests that the teachers attached sufficient importance to the class learning as a whole group, such that they would give guidance to the whole class, when this was judged to be appropriate, while also continuing to give assistance to individual students (Hino, 2006). Guiding Whole Class was enacted differently according to the teacher's judgment of the situation: either upon perceiving the difficulties among students to be general, the teacher would interrupt students' work by making clarifications to the whole class; or the teacher would provide information, instruction or advice to the whole class during Kikan-Shido as a way of orchestrating whole-class activity.

On identifying the common mistakes among the students, Hong Kong Teacher 2 would give instructions to the whole class while walking around in order to remind the class of the errors they made or tended to make. In the example below, instructions to the whole class were interspersed with comments to individual students.

HK-T2 [to VANESSA] Young lady, you've copied down the question wrongly. You are really overtaken by the twins!
HK-T2 [to S] What's wrong? Okay.
HK-T2 [to whole class] Hey, be careful with one thing. You've got one thing, your fatal mistake is miscopying questions. Very often you copy from your book wrongly, or you've copied the first thing correctly, but you get it wrong in the second step. Is this illusion or what? Is this a kind of 'sense dis-coordination'?





On many occasions, German Teacher 3 would Guide the Whole-Class Activity through a series of specific teacher questions and explicit instruction intended to scaffold the students' understanding. For example, during an on-task activity where the students were asked to determine the surface area and volume of a rectangular prism they had made (see Figure 4), the teacher walked around the classroom Monitoring Student Progress and repeatedly Guided Student Activity by questioning and instructing the whole class.

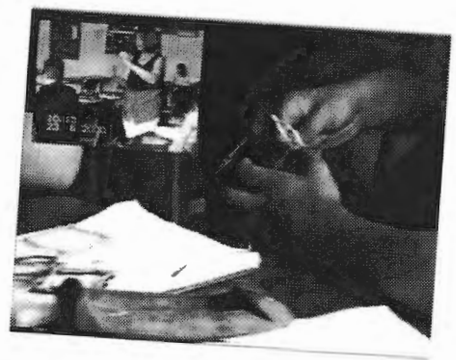

*Figure 4. Orchestrating Whole-class Activity*

One example taken from the video record is quoted below:

G-T3 If you put this together like this //then you'd need two squares too but do I have a square that big here?
S //Yeah then it works without it too.
S No.
G-T3 I don't have one. And two rectangles would they fit in there?
S No.
S Yeah they would ( ).
S And four of those things wouldn't fit either.
G-T3 When would two rectangles fit in there?
S If you put them in like this.
G-T3 When would exactly two such rectangles fit in there on each … side … when?
S If the rectangles … building houses again.
G-T3 Check this out.
G-T3 Is this exactly half … of this long side?
S Yeah.
G-T3 No, it's not half, it's more, that means I wouldn't be able to fit two next to each other so I wouldn't be able to stick in two rectangles next to each other. I would have to have a bigger square but we don't have one. You should stick them together along the long edge then it works yeah. Because top surface and base are supposed to be the square. So. That's right.

Here the Teacher alternates between questioning students and explicit instruction. The transition from questioning students to instruction appears to be predicated on the Teacher's judgment of the level and frequency of student difficulties.

## VARIATION ACROSS THE TEN-LESSON SEQUENCE

While Kikan-Shido has a recognisable structural form evident across all classrooms, the variation in the amount of time devoted to Kikan-Shido suggests that it is employed purposefully in distinctive ways in each lesson. For example, in US1 there was significant variation in the amount of time the Teacher devoted to Kikan-Shido in each lesson (see Figure 7). While Kikan-Shido represented only 8.8% of total class time across the ten-lesson sequence, the teacher made extensive use of Kikan-Shido in Lesson 7 (35.2% of total class time). Similarly, the amount of time allocated to Kikan-Shido in HK3 also varied across the ten-lesson sequence (see Figure 5). It is clear that this teacher devoted significantly more time to Kikan-Shido during the last five lessons, especially in lessons 6 and 9.

The variation in the use of Kikan-Shido across the ten lessons taught by HK-T3 (see Figure 5) confirms the point made in Chapter 2 of this book, that any attempt to characterise a teacher's practice by a single lesson pattern ignores the teacher's purposeful selection of structural elements according to the location of the lesson in the topic sequence. The same purposeful variation is evident in Figure 7, which documents US-T1's selective use of Kikan-Shido across the ten-lesson sequence.

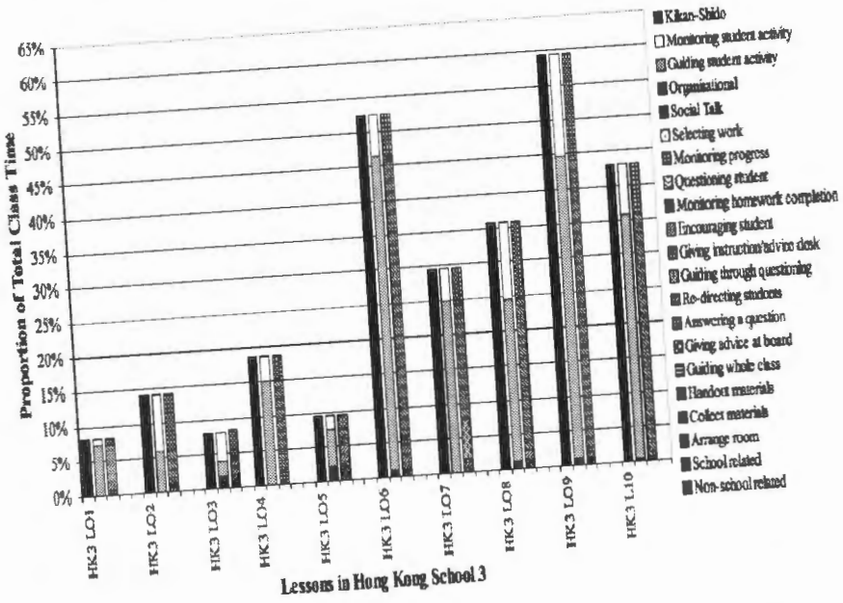


*Figure 5. Variation in the utilisation of Kikan-Shido across a ten-lesson sequence*

Figure 5 suggests that this variation is related to the location of the lesson in the topic sequence. The first five lessons have more direct instructional components (such as teacher demonstration) and therefore require less one-on-one student scaffolding. However, the following excerpt taken from the post-lesson teacher





interview suggests that the teacher's utilisation of Kikan-Shido in Lesson 9 was also dependent on the degree of difficulty of the subject matter, the level of student comprehension and student willingness to learn.

HK-T3 Actually, today there was one problem. I didn't expect that there would be so many hands up. So that you see that the situation was relatively messy. And I couldn't answer them all.

Int Ha ha. Many students called you?

HK-T3 Yes. It's at the same time they suddenly … many … many of them had something to ask. It is different from the previous lesson. They didn't have questions in the previous lesson. Maybe it was about integers and was easy. The calculation was easy. So they thought they could do it.

Int So is today's lesson content difficult to them?

HK-T3 Yes, it's more difficult.

Int In today's lesson so many students asked you questions. What do you think about it?

HK-T3 Talking about asking questions they are already quite active in today's lesson. You'll see that in some lessons, they … comparatively the children are more talkative. They don't ask questions, but they are talkative … Yes. They chat among themselves. But today actually they do learn. I mean, you'll see that they are willing to learn. So they have many questions to ask. When they're asking, perhaps … like student A asks something, student B will rebut him. He'll rebut him even before I answer anything. It's like this … yes, among the students. And you can see that one student asks questions and then another will stand up to see what the question is. I mean … I mean they have such a situation.

This teacher's observation that "they didn't have questions in the previous lesson" suggests that the variation in the amount of time devoted to Kikan-Shido was influenced by two important factors: the degree of difficulty of lesson content and the students' willingness to learn. The practice of Kikan-Shido in this classroom thereby provides supporting evidence for our argument that all participants are able to shape the particular body of practice signified by Kikan-Shido. That is, this pattern of participation is jointly constructed.

## WHOLE-CLASS COMPLICITY IN PATTERNS OF PARTICIPATION

Of major interest for the purpose of this chapter is the evidence that Kikan-Shido is a co-constructed pattern of participation to which members of the classroom community subscribe. In an attempt to situate the participatory status of both the teacher and students during Kikan-Shido, each lesson was further analysed to identify whether each coded instance was initiated by the teacher or student. For this purpose, Monitoring Progress (where this was non-verbal and non-interactive) and all activity codes within Organisational were not coded for initiated interaction. Table 3 defines each interaction code.

*Table 3. Student and Teacher Initiated Interaction*

| | |
|---|---|
|  | **Student Initiated Interaction**<br>The process through which the student calls for the teacher's attention, through verbal and non-verbal acts, with the intention to confirm progress, confirm solutions to a problem or request guidance. Verbal acts by students included calling out, asking a question, or making a statement. Non-verbal student acts included hand up, approaching the teacher and showing work. |
|  | **Teacher Initiated Interaction**<br>The process through which the teacher instigates verbal and non-verbal communicative acts with the student(s) with the intention to Monitor or Guide Student Activity, or engage student(s) in conversations of a social nature. |

Figure 6 graphically illustrates both the similarities and the significant differences in the way that both teachers and students subscribe to the pattern of participation within Kikan-Shido. For example, if we compare HK3 with A2 we find similarities in the relatively high proportions of Student-Initiated Interaction. If we compare, G3 with J3 we find similarities in the weighting of Student-Initiated Interaction and Teacher-Initiated Interaction. However, real understanding of the pattern of participation enacted within each classroom is only evident from a combined analysis of Figure 2 and Figure 6.

Figure 6 suggests one particular commonality that was shared by all three Japanese classrooms: that is, the teacher initiated a large proportion of Student-Teacher Interactions. However, Figure 2 shows that the classroom practice of Japanese Teacher 3 was quite different from the other two Japanese teachers with respect to the high proportion of time devoted to Guiding Whole-class activity. This interweaving of similarity and difference was highlighted by Clarke (2003) as characteristic of international comparisons of classroom practice. The Japanese example shows that this is true of within-country comparisons as well. A phenomenon as complex as classroom practice can be characterised in many different ways. Similarity in one aspect does not mean similarity in all aspects.

In fact, teachers within one culture may differ in many respects. For example, if we compare the three Hong Kong classrooms as represented in Figure 6, it is clear that HK2 evidenced more Teacher Initiated interaction, while HK1 and HK3 had a much higher frequency of Student Initiated Interactions. With respect to Guiding and Monitoring (Figure 2): HK1 had a higher proportion of Guiding Student Activity, with an emphasis on Guiding Whole Class; HK2 gave equal weight to Guiding and Monitoring Student Activity; while HK3 was similar to HK1 in the frequency of Guiding Student Activity, but very different in that the guidance took the form of Giving Instruction/Advice at Desk.

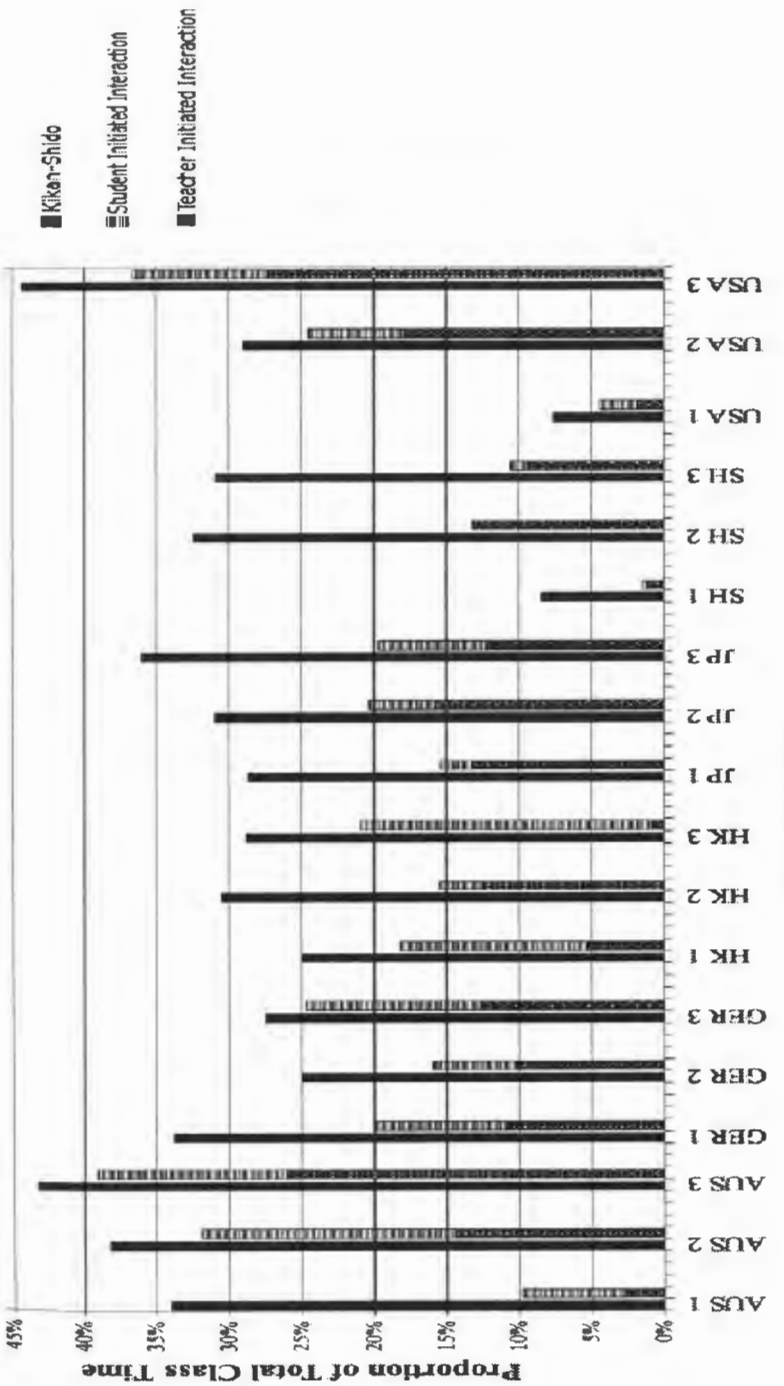


*Figure 6. Student and Teacher Initiated Interaction during Kikan-Shido*

Both similarity and difference can provide insights. Variation in one aspect of classroom practice suggests tolerances within the socio-cultural norms of practice affecting both teacher and student behaviour. Tolerance of such variations suggests that no highly-valued principle is being challenged by the variations. Similarity suggests that practice may be predicated on a shared pedagogical principle. Where the similarity is specific to the classrooms in one country (or one cultural grouping), then the principle may reflect a socio-cultural norm specific to that country (or cultural grouping). Any such similarities identified within the LPS data may be researchable through analysis of the TIMSS video data, if a case for national or cultural typification was to be made. Our interest, where similarities occur, is in the identification of commonalities in the practices of competent teachers. One of these characteristics is clearly the purposeful selection of instructional strategies in response to topic, lesson location, class capabilities and individual student need, within the affordances and constraints of school system and culture.

*Relating Teacher and Student Perspectives*

The post-lesson interviews from both teachers and students revealed that Kikan-Shido has a recurrent form, recognisable to those participating in it. This is not to say that the participating teachers and students attributed corresponding meanings to the activity. The point has already been made (Clarke, 2001, p. 296, and elsewhere) that individuals can participate in a practice whilst being positioned differently within it, and whilst attributing different characteristics to the activity. That is, without being identical, the participants' descriptions of the activity make it clear that they are talking about essentially the same form, but they may attribute quite different functions to that form. For example, in Australia school 3, the Teacher's intention appears to be predicated on the devolution of the responsibility for knowledge generation from teacher to student(s):

A-T3 Often I just enjoy sitting down with … a student and saying … "mmh well … let's think about this because I don't know the answer" … let's try and see if we can find a way [sigh] and I … will make suggestions … But, ah yeah, I think sometimes it's *good* that- and they can *see* that I don't know … as well, and I am happy to call in somebody … and … ask other students if they've done it and if they have … ideas.

This can be contrasted with one student's description of Kikan-Shido that suggests this same Teacher's activity was typically quite directive:

Int Alright- okay I- I am just interested in- when Mrs. Greeno *comes* … and *goes* … what sort of feelings you have … *then*?
Rhys Probably makes … um sometimes it helps you to focus a *bit more* …
Int Aha.
Rhys most of the time probably it makes us focus a bit more … and … yeah I mean you won't know … *how* … *how well* you are doing unless she comes and … has a look and sees if you are doing alright on not … so …





Int So it helps you to know what you are doing?
Rhys It helps- yeah it *does* … cause yeah … well … I don't know if it was that lesson but I had trouble with … ah … the … w- what do you call it? … The … *equation* … type of thing- the way you set- like you get the two numbers and you have to like … I didn't know … which way to set it out … when she comes and tells you what to do … then you're on your way like know what to do and everything.

While each participant is talking about the same form, i.e. Kikan-Shido, it is clear that each participant attributes quite different functions to that form. Evidence that students contribute to the form taken by a pattern of participation such as Kikan-Shido can be found in the following statement from A1-LO9:

S She's a *big* help … it's such a *change* from … last year um I had … a pretty *bad teacher* … and I spent most of the lesson with my hand up wanting to get help but she didn't- and she didn't help me … and … I *failed* … *every* maths test- I can't remember if I passed … *even one* … but Mrs M … this year she *explains* … *everything* to *everyone* before … you do the test … or anything she explains it *really really well*.
S Can you describe what it is *like* being in Mrs Milano's lesson in terms of *how* you sort of … *feel* … before you even come in to a lesson?
S Well after- Maths isn't my *favourite* … subject …
Int [laugh]
S *ah* … but it is good to know you have got a *good teacher* who can … *help* you … and … if you don't know anything … she's there.

In general, many students in this class attached a high level of significance to the co-construction of Kikan-Shido. Indeed, many students' participation in classroom practice in general seemed to be predicated significantly on the belief that Kikan-Shido would provide them with valued support should they need it. From the post-lesson interviews, students predominantly valued individual assistance, explanation and advice and the opportunity to ask questions (see Table 4 for a breakdown of student references to Kikan-Shido). One example from A1 is cited below.

S Oh … ah it's really good when Mrs Milano comes around to every-one individually … it's like so if you are not sure about anything … you just like … she'll come around.
Int Oh I see.
S Yeah.
I Alright … it- it's pretty good you say, can you tell me more?
S Yeah, like, say if you um don't know something when she's talking, when she's up the front and, yeah, of the class and she comes around to every-one to see like how you've been doing so you can see like, if you are doing well or not and understanding you can just ask her individually.

*Table 4. Student Reference to Kikan-Shido in the post-lesson interview*

| Focus of Student | School and Country | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AUS 1 | AUS 2 | AUS 3 | GER 1 | GER 2 | GER 3 | HK 1 | HK 2 | HK 3 | JP 1 | JP 2 | JP 3 | SH 1 | SH 2 | SH 3 | USA 1 | USA 2 | USA 3 | TOTAL |
| Kikan-Shido | 23 | 13 | 6 | 12 | 5 | 7 | 4 | 4 | 9 | 6 | 2 | 10 | 1 | 1 | 12 | 4 | 14 | 11 | 147 |
| Confirmation | 2 | - | 1 | 2 | - | - | - | - | 2 | 1 | - | 1 | - | - | 2 | - | 2 | - | 13 |
| Demonstration of task | 4 | 1 | - | 1 | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 7 |
| Explanation/Advice | 5 | 6 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 2 | 3 | - | 1 | 2 | 2 | - | 4 | 40 |
| Individual assistance | 4 | 1 | 2 | - | 1 | 1 | 1 | 2 | - | - | - | 1 | - | - | - | - | 2 | 1 | 16 |
| Monitoring work | 4 | - | 1 | 2 | - | 2 | 1 | - | 1 | - | - | - | - | 1 | 2 | 1 | 3 | 3 | 21 |
| Organisational | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 |
| Re-directing students | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 |
| Selecting work | - | - | - | - | 1 | - | - | - | - | - | - | 3 | - | - | 2 | - | - | - | 6 |
| Social | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| Student questions | 1 | 1 | - | 1 | - | 2 | 3 | - | 4 | 3 | 2 | 2 | - | - | 2 | - | - | 2 | 23 |
| Teacher questions | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | - | 1 | - | 4 |
| Walking around | 2 | 1 | - | 3 | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 | 11 |

Based on our analysis of the Teacher Interviews, the Lesson Event we have called Kikan-Shido was explicitly valued by all three Australian teachers, in particular Teachers 1 and 3 (A-T1 made 7 references to Kikan-Shido; A-T3 made 10). Interestingly, the number of times each teacher referred to their Kikan-Shido practice was in proportion to the time these teachers committed to Kikan-Shido. This was also the case for US Teachers 2 and 3, Hong Kong Teacher 1 and all Shanghai teachers. For example, Shanghai Teacher 1 did not commit a large proportion of the class time to Kikan-Shido (8.4%). It is not surprising that this teacher did not refer to Kikan-Shido in the post-lesson interviews. In an exception to this pattern, if we compare SH1 with US1, we find similarity in the time devoted to Kikan-Shido, but difference in each teacher's reference to Kikan-Shido. The teacher in US School 1 referred to Kikan-Shido three times during the post-lesson interviews. However, two of these three references corresponded to the one lesson (L07), when the teacher devoted a large proportion of class time to Kikan-Shido. That is, this exception is the sort of anomaly caused when an atypical situation affects a low occurrence count. As a general pattern, teachers made reference to Kikan-Shido with a frequency largely consistent with their use of it.

The teacher in Japan School 1 stressed the importance of the monitoring function of Kikan-Shido.

J-T1 I was walking between desks and seeing how students were doing. I could see how most of the students were doing by looking from the front of the class. But I cannot see *all* the students, and it is hard to see how those who are most likely to be behind are doing. So I gave them the clear procedure of how to work on such problem, to make a table for a graph, and an equation from a table.





Int I see. Did you feel anything by then? Like, there were more students who take a bit more time to understand this than you thought?

J-T1 Those who wouldn't work on the problem were most likely to be those who don't like studying. Those students were, ah, same as usual, those I expected.

Int And you saw what you expected, huh?

J-T1 Yes. So I stopped by and gave some advice to those students.

The above interview excerpt emphasises the importance attached by this teacher to monitoring students individually and at a level of detail not possible from the front of the classroom. It also establishes the teacher's willingness to intervene or guide individual student activity during Kikan-Shido.

### *The Use of Physical Positioning*

The ways in which teachers chose to position themselves physically during Kikan-Shido was often a teaching strategy intended to influence the nature of the interactions. In Australian School 1, the teacher's deliberate physical positioning was utilised to minimise any intimidation of the students and, implicitly, to reduce the prominence of the inevitable power difference between the teacher and the student.

A-T1 I don't want my presence to be overpowering. I don't want them to think, "Oh she's over me just telling me what to do." I don't want to come down on them, and so a lot of the time I do kneel down … and I try to get on their level.

In all three Australian schools, German Schools 1 and 3, Shanghai School 3 and Japan School 2, the positioning actions of each teacher were influenced by student behaviour and the level of student engagement in the on-task activity. Often the teacher would intentionally stand near a student, Giving Instruction or Advice at Desk or Ask a Question, in an attempt to regulate the students' behaviour. The following example from SH3–L08 indicates that the teacher's strategy was also evident to other participants in the class:

S Our teacher is very humorous. Um, … for example … there's one student … there's a student in our class, he is called Bear, he does physical exercises in class, at one time, he was moving around, but then the teacher didn't scold him, just go over and watched him, and smiled to him, then he stood very still.

This example illustrates one student's sensitivity to the significance of teacher positioning.

### *Pattern of Participation During Assessment*

It might be thought that there is less instructional teacher activity associated with a class test and, as such, the predominant teacher activity during Kikan-Shido in such lessons is likely to involve Monitoring Student Progress or Kikan-Junshi (Between

Desks Patrolling). However, our analyses revealed that, during the only two class tests among the lessons analysed (US1 and A3), the teachers and students participated in Kikan-Shido specifically to Guide Student Activity. During the class test, both US Teacher 1 and Australian Teacher 3 devoted more time to Kikan-Shido than during any other lesson in the ten-lesson sequence. Figure 7 graphically illustrates US Teacher 1's utilisation of Kikan-Shido across the ten-lesson sequence, of which lesson 7 is the class test.

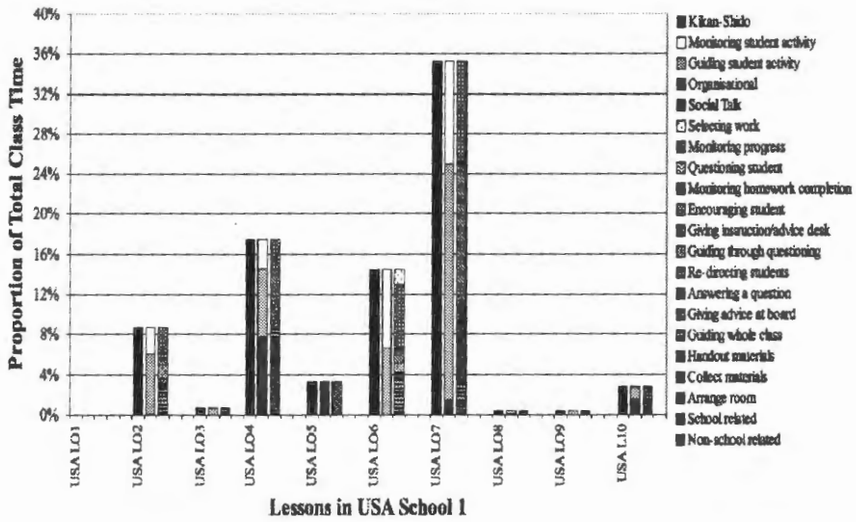


*Figure 7. Variation in the utilisation of Kikan-Shido across a ten-lesson sequence*

US Teacher 1 devoted 35.2% of that lesson (US1-L07) to Kikan-Shido. While the teacher did Monitor Student Activity (10.2% of total class time), more time was devoted to Guiding Student Activity (23.6% of total class time) and, in particular to: Giving Instruction / Advice at Desk (12.9% of total class time); Answering Questions (8.4% of total class time); and Guiding Whole-class Discussion (1.6% of total class time).

The pattern of participation in US1-L07, as seen in Figure 8, clearly demonstrates that both students and the teacher contribute to the form of Kikan-Shido and that this pattern of participation supports to some extent, the assertion that both the teacher and students share a common interest in advancing the students' learning. Figure 8 illustrates the high proportion of Student-Initiated Interaction (19% of total lesson time) compared with Teacher-Initiated Interaction (5.6%) during the class test. As can be seen in Figure 8, Kikan-Shido also accounted for a further 10% of total lesson time but this did not involve either type of initiated interaction.





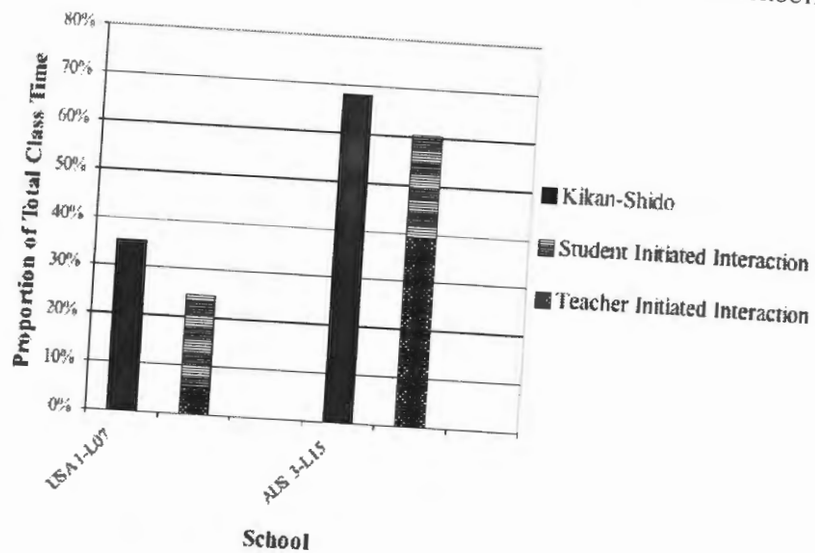


*Figure 8. Student and Teacher Initiated Interaction During a Class Test*

It was during the class test that US Teacher 1 devoted the greatest proportion of time to Kikan-Shido (35.2% of total class time) of any lessons in the US1 ten-lesson sequence. Similarly in A3–L10, during another class test, the teacher also significantly increased the proportion of time devoted to Kikan-Shido (68% of total lesson time) of which the majority was teacher initiated (39.1% of total class time) but also with significant levels of student initiated interaction (21.3% of total class time) (see Figure 8).

While Australian Teacher 3 did Monitor Student Activity during the test (16.1% of total class time), the teacher devoted substantial lesson time to explicitly Guiding Student Activity (48.5%). In general, this guidance took two specific forms: Giving Instruction / Advice at Desk (20.9%) and Guiding Student Activity through Questioning (15.1%). The reconstructive account from the teacher's post-lesson interview illustrates the Teacher's use of these strategies.

A-T3 I'm trying to … *encourage* them to *put down* what they think … okay- to put down … what comes into their mind.

Int Can you find some instances of it- and can you just go through … what you were thinking … at those times?

A-T3 Shayne has a short-term memory, ah, it's just, what I try to do, is try to, *verbalise*, go through and drop some key-, well, for him to pick up on some key words.

Int Oh can you give … an example?

A-T3 Um, you know, I'll sort of often say, "Now percentage is always out *of* … "

Int Aha.

A-T3 "Okay so and yeah … and we've got ten percent there so … think about how you are going to set that out then … "

The significance of the teacher's explicit guidance was further acknowledged in her post-lesson interview:

A-T3 Is it yeah because, for so many of these students that have learning … difficulties, um, and have had *negative* experiences *all* their life and if you talk to their parents they will say they've had all these negative experiences and they'd been often very negative about maths. And to *me*, the biggest thing I can do is take that fear away from them and to make it as approachable as possible and to emphasise to them that not everybody can do everything very well … And we've got to, um, get them thinking about 'yes it's okay to ask', but I will slowly have a bit less involvement over a period of time.

In this example, the teacher indicates her strong desire to support student learning, while acknowledging the challenges of teaching students with learning difficulties. The teacher also communicates her commitment to the development of student confidence by providing support and encouragement. It is clear that despite the constraints encountered by both students and teacher, the teacher's activity is intended to promote student participation in and commitment to the learning process. This supports the contention of Clarke (2001), who argued that learners construct their participation and ultimately their practice through a customising process in which their inclinations and capabilities are expressed within the constraints and affordances of the social situation. The example above illustrates the way in which one teacher facilitated the incremental increase in the students' participation. The reduction, over time, in the explicit scaffolding provided by the teacher is a fascinating example of what Lave and Wenger (1991) have termed the student's 'legitimate peripheral participation' in the practices of the classroom.

## CONCLUDING REMARKS

This chapter embodies the aspiration to find structure in the ephemeral. To a significant extent, the realisation of this goal has been assisted by the conception of Kikan-Shido as an internationally recognisable Lesson Event: a whole-class practice, having a certain visible form, with a locally-enacted pattern of participation to which teacher and students subscribe and which both teacher and students have agency to exploit and to shape.

While Kikan-Shido characterises a recurrent form evident across all the classrooms, its functions appear to be a consequence of the emerging patterns of participation in which the members of a particular classroom community engage. In order to accommodate both the fluidity of social interaction and its regularity, careful distinctions have been made to delineate the form and function that constitute each teacher's enactment of Kikan-Shido in their classroom. Our analyses have identified the differences in teachers' utilisation of Kikan-Shido as a signature characterising their practice. We suggest that these differences are predicated on the specific pedagogical principles that appear to underlie each teacher's practice. Another issue central to this chapter is the distribution of the responsibility for knowledge generation. Our analyses of Kikan-Shido have





demonstrated that this perspective provides a powerful explanatory framework for identifying similarities and differences of classroom practices in both 'Asian' and 'Western' settings. In particular, analysis from this perspective problematises the simplistic characterisation of 'Asian' or 'Western' pedagogy.

In this chapter, we have attempted to frame the argument that the pattern of participation designated by Kikan-Shido must be conceived as co-constructed by both teachers and students. Some examples given in this chapter have shown that Kikan-Shido can be thought of as a familiar dance done by teachers and students, where the steps are improvised according to need. The participants in the classroom, teacher and students, are complicit (co-conspirators) in this improvisation. Acceptance of this point has implications for the research designs by which we study the activities occurring in the classroom settings.

But co-construction of practice and joint participation in practice do not connote commonality of purpose among the participants in that (classroom) practice. Through juxtaposing individuals' actual participation in Kikan-Shido with the reconstructive accounts from interviews, we were able to get insight into the meanings that were attributed to that form. Our analyses of whole-class patterns of participation show that even where all participants recognised and subscribed to the same pattern of participation (Kikan-Shido), they could attribute different characteristics to the activity.

If we conceive of institutionalised patterns of participation as taking on the status of bodies of practice, then their co-constructed nature has further significance. Rather than progressively increasing the competence of their participation in a culturally or socially pre-determined practice (e.g., Lave & Wenger, 1991), this conception of the origins of practice accords significant agency (however constrained by institutional or cultural norms) to the participants to shape their particular pattern of participation, and thereby to influence the nature of that practice. This approach to conceptualising classroom practice further challenges those simplistic East-West comparative cultural analyses that presume a generality of pedagogical strategy and its intact cultural transferability.

The similarities and differences documented in this chapter set out the degree of variation possible in the practices of eighteen competent teachers situated in six very different school systems around the world. Among other things, our analyses suggest that the responsibility for knowledge generation can be purposefully distributed in the classrooms of competent teachers, within the institutional and cultural norms constraining that practice. The nature and practice of this distribution of responsibility is the subject of further analysis and will be reported elsewhere. Because of its prevalence, its familiarity of form, together with its diversity of function, the Lesson Event that we have designated by 'Kikan-Shido' provided a particularly rewarding focus for our analyses, rich with insights into the pedagogical principles on which competent teachers around the world base their practice.

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